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April 10, 2012

Also Sent Via E-mail

Robert J. Wyatt
NW Natural
220 N.W. Second Avenue
Portland, OR 97209

**Subject: Revised Data Gaps Field Sampling Plan
NW Natural "Gasco" Site
ECSI #84**

Dear Mr. Wyatt:

The Oregon Department of Environmental Quality (DEQ) reviewed the "Field Sampling Plan, TPH Fraction Data Gap Sampling - NW Natural Gasco Site," dated March 2012 (Revised Data Gaps FSP). NW Natural prepared the Revised Data Gaps FSP based on DEQ's October 25, 2011 comments on the Draft Data Gaps FSP[1] and meetings on November 18, 2011 and February 23 2012, including related correspondence. Anchor QEA, LLC prepared the Revised Data Gaps FSP for NW Natural.

The Revised Data Gaps FSP includes:

- The scope of work for conducting drilling and sampling activities in five former manufactured gas plant (MGP) process and waste management areas on NW Natural's property (i.e., "Gasco Site");
- Approaches for collecting samples of visibly impacted material for analysis of MGP waste petroleum hydrocarbon ranges and constituents, and site-specific chemicals of interest (COI) for which data are limited; and
- Discussions of how the sampling and analytical results will be used to determine site-specific risk-based concentrations (RBCs) for MGP total petroleum hydrocarbons (TPH) and evaluate concentrations of MGP TPH and data-limited COI across the site.

The results of the work completed under the Revised Data Gaps FSP will be incorporated into the human health (HHRA) and ecological (ERA) risk assessments for the Gasco Site.

The primary purpose of this letter is to inform NW Natural that DEQ approves the Revised Data Gaps FSP subject to the document being revised and resubmitted consistent with the comments and revisions indicated in this letter. DEQ's comments are intended to clearly communicate the objectives of the sampling program, clarify expectations regarding the sampling approach, and provide revisions that modify the field sampling plan accordingly.

DEQ is requesting the document be revised and resubmitted as it will likely be used as a reference in the field during drilling and sampling work. Field work conducted by NW Natural will be observed by GeoEngineers, Inc. on behalf of DEQ. Consequently, a single final document will reduce the potential for misunderstandings between field personnel observing and participating in the work.

[1] Anchor QEA, LLC., 2011, "Field Sampling Plan, TPH Fraction Data Gap Sampling – NW Natural Gasco Site," August 12, a field sampling plan prepared for NW Natural.

GENERAL COMMENT

As discussed above, the Revised Data Gaps FSP includes a scope of work for drilling and sampling in five former MGP process and waste management areas (process/waste management areas). NW Natural and DEQ previously reached agreements on the boundaries of the exposure areas for the HHRA and ERA. The boundaries of the HHRA and ERA exposure areas and the former process/water management areas do not coincide. For example, as shown by Figure 2 of the Revised Data Gaps FSP, three former process/waste management areas occur within the Former Tar Pond Area exposure area. NW Natural acknowledges this situation and proposes an approach in Section 5.2 for screening site data against a site-specific MGP TPH RBC. DEQ does not approve NW Natural's proposed approach because additional information is needed from NW Natural to evaluate the proposal. For purposes of conducting the risk assessment an approach will need to be agreed upon. However rather than attempting to resolve the issue in this comment letter, DEQ believes the topic should be incorporated into and addressed by the Risk Assessment Work Plan[2] which is currently in review. DEQ recommends discussing the topic further while our review of the document is being conducted and then incorporate the agreed to approach into our comments.

SPECIFIC COMMENTS

Section 1.1. The last bullet in this section introduces a new term (i.e., "risk area") which is used in the Revised Data Gaps FSP. DEQ understands "risk area(s)" is synonymous with former process/waste management areas, a term which along with "source area(s)," has been used previously. Sampling performed under the Revised Data Gaps FSP will be conducted in the former process/waste management areas listed in Section 2.1.

To avoid misunderstandings regarding the scope and meaning of the new term and for consistency, the Data Gaps FSP should be revised, and "risk area(s)" should be replaced with "former process and waste management area(s)" throughout.

Section 2. Information regarding the general approach to conducting drilling and sampling work is provided in Section 2. Based on the information provided, DEQ approves the general description provided for collecting samples from 0-3 feet. However, it appears NW Natural is proposing an objective for conducting sampling between 3-12 feet that is inconsistent with DEQ's October 25, 2011 letter on the Draft Data Gaps FSP. The Revised Data Gaps FSP indicates that, "The objective is to complete at least two borings within each risk area that have visibly impacted zones in the subsurface sample intervals." DEQ does not approve this objective or the discussion that follows in the Revised Data Gaps FSP.

NW Natural should replace the second paragraph of Section 2 with the following text to the point indicated:

> "The borings selected by DEQ will be drilled in five former MGP process and waste management areas. The borings were selected based on observations of MGP waste made previously during drilling at these locations (see Table 1). The objective is to complete drilling at each of the selected boring locations and collect samples from intervals with visible evidence of MGP waste. Samples will be collected and analyzed to characterize the composition of MGP TPH and concentrations of data-limited COI in MGP waste in each of the five process/waste management

[2] Anchor QEA, LLC, 2012, "Work Plan, Human Health and Ecological Risk Assessment, NW Natural Gasco Site," March 22, a work plan prepared for NW Natural.

areas. If evidence of MGP waste is not observed in each of the borings within a process/waste management area, then NW Natural will advance up to two additional borings in that area. Each boring will be divided into a surface interval (0 to 3-feet below ground surface [bgs]) and subsurface interval (3 to 12 feet bgs). For the surface interval, samples will be collected that represent the entire 3-foot interval. Samples collected from the subsurface interval will be obtained from soil with visual evidence of MGP waste. Samples from the same depth interval (i.e., 0-3 ft or 3-12 ft bgs) and process/waste management area will be composited in the field or prior to analysis as described in Section 2.3. Surface and subsurface samples will be analyzed for all of the compounds needed to calculate site-specific RBCs for MGP TPH, including volatile petroleum hydrocarbon (VPH);..."

Section 2.1. The first sentence of the last paragraph should be deleted as it is inconsistent with the changes made to sections 2 and 2.3.

Section 2.3. Section 2.3 provides more detailed descriptions of core processing procedures, including the proposed protocols for sample collection and handling. DEQ's comments on selected items are provided below.

- Item 1, Identify Sampling Zones. Consistent with DEQ's comments to Section 2, the third sentence should be revised as follows:

  "Areas with visual evidence of MGP waste will be identified, and sampling zones in the subsurface interval will be selected."

- Item #2, Samples for Volatiles Analysis. The Data Gaps FSP indicates that for the depth interval between 3-12 feet, samples for volatile parameter analysis[3] will be collected from up to three depth intervals exhibiting "visual evidence of MGP impacts." The Data Gaps FSP further indicates that if different MGP waste types are observed in a boring, then samples of each waste type will be collected from up to three depth intervals. NW Natural's sampling approach described here appears to set limits on the number of depth intervals in each boring available for collecting samples, and appears to propose collecting and analyzing samples of different MGP waste types within the same waste management/process area. DEQ does not approve the approach as it inconsistent with DEQ's October 25, 2011 letter where the material to be sampled and the numbers of samples are concerned. In addition, NW Natural's approach appears to be at odds with the goal of developing a single MGP TPH RBC for each process/waste management area. NW Natural should revise the section of Item #2 for the 3 to 12-foot depth interval as follows:

  "3- to 12-foot interval. At each boring location En Core® sampling devices will be used to collect samples from each depth interval with visual evidence of MGP waste, including but not necessarily limited to tar, dense non-aqueous phase liquid (DNAPL), DNAPL oil, lampblack, and/or carbon pitch, or any combination of these materials, and/or mixtures of these materials with soil. If evidence of MGP waste is not observed between 3-12-feet, this interval will not be sampled and an additional boring will be drilled."

  DEQ understands it is likely questions regarding the nature of the material observed and sample collection will arise during the course of field work. The revision above attempts to resolve some potential questions. That said, DEQ anticipates the NW Natural and DEQ teams will further resolve potential points of disagreement in the field during the initial stages of the drilling and sampling program. In the event unanticipated conditions develop (e.g., absence of evidence of MGP waste at a

[3] Volatile parameters include volatile petroleum hydrocarbons (VPH); gasoline-range petroleum hydrocarbons (TPH-Gx); benzene, toluene, ethylbenzene, total xylenes (BTEX compounds); naphthalene, 1,2,4-trimethylbenzene (1,2,4-TMB), and 1,3,5-trimethylbenzene (1,3,5-TMB).

selected boring) or changes to the final Data Gaps FSP are being contemplated in the field, then the situation should be elevated, discussed, and resolved between the NW Natural and DEQ project managers. For clarification, DEQ considers NW Natural's proposal to drill additional borings to be an acceptable contingency measure in situations where evidence of MGP waste is not observed. Furthermore, DEQ accepts NW Natural's proposal to set an upper limit on the number of additional borings and believes two additional borings in a process/waste management area is a reasonable estimate.

- Item 3 (Core Logging). For completeness, core logging procedures should indicate that subsurface material will be described consistent with ASTM Standard D 2488-93. In addition, the depth and thickness of intervals with evidence of MGP waste or evidence of MGP waste impacts (e.g., sheen, staining) should be measured in the field and indicated on borings logs completed for each boring.
- Item 5, Samples for Non-volatile Analysis. This item should indicate that individual discrete samples collected from between 3-12 feet in each boring within a process/waste management area will be placed in a labeled laboratory-supplied sample container and stored on ice until compositing for that area occurs (i.e., should be handled as a sample prior to compositing).
- Item 7, Fill Sample Jars for 3- to 12-foot Interval. The list of volatile parameters referenced here is incomplete. The third sentence should be revised to read as follows:
  "The VOC sample aliquots will undergo analysis for VPH; TPH-Gx; BTEX compounds; naphthalene; 1,2,4-TMB, and 1,3,5TMB."
  In addition, samples should be accompanied by clear written instructions from field personnel to the laboratory regarding how volatile parameter sample compositing should be conducted (e.g., written instruction on the chain-of-custody form).
- Item 9, Pack on Ice. All sample containers shipped to the laboratory should be placed in sealable Zip-lock® type bags to prevent containment transfer during handling and transport and reduce the potential for cross-contamination and/or contaminant dispersal should sample containers break.

Section 3.1. Sampling and sample processing equipment are not specifically identified by the Revised Data Gasp FSP. However, given the nature of the material to be sampled, DEQ believes it may be difficult to decontaminate certain tools (e.g., stainless-steel spoons for collecting and mixing semi-volatile and non-volatile parameters). DEQ recommends that sufficient numbers of these tools be purchased to allow them to be decontaminated prior to use then discarded after use.

Section 5.3.1. NW Natural indicates data from the data gaps sampling work "...will be used to develop correlations between 1,2,4-TMB; 1,3,5-TMB; 1-methylnaphthalene; and 2-methylnaphthalene; and an analyte with sufficient existing data." For clarification, DEQ's October 25, 2011 letter commenting on the Draft Data Gaps FSP approved NW Natural's recommendations to use benzene as the analyte with sufficient existing data to develop correlations with 1,2,4-TMB and 1,3,5-TMB; and naphthalene for developing correlations with 1-methylnaphthalene; and 2-methylnaphthalene.

NEXT STEPS

NW Natural should revise the Data Gaps FSP consistent with the comments provided in this letter. The revised document should be resubmitted to DEQ by Tuesday April 24, 2012.

Please feel free to contact me with questions regarding this letter.

Sincerely,

Dana Bayuk
Project Manager
Portland Harbor Section

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